



TORQ Analysis of Maintenance Workers, Machinery to Electric Motor, Power Tool, and Related Repairers

INPUT SECTION:

Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Electric Motor, Power Tool, and Related Repairers	49-2092.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

OUTPUT SECTION:

Grand TORQ:

88

Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	87	Level	90	Level	86

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Finger Dexterity	59	15	75	Critical Thinking	61	7	71	No Knowledge Upgrades Required!			
Visual Color Discrimination	53	16	59	Equipment Selection	67	6	82				
Speed of Closure	41	15	53								
Manual Dexterity	55	11	68								
Hearing Sensitivity	48	13	56								
Depth Perception	50	9	53								
Auditory Attention	53	9	50								
Selective Attention	51	7	56								
Information Ordering	48	6	62								
Control Precision	55	7	53								
Category Flexibility	44	7	50								
Reaction Time	48	6	56								
Near Vision	51	5	62								
Written Comprehension	48	6	50								
Far Vision	42	5	53								
Arm-Hand Steadiness	50	4	62								
Visualization	50	4	59								
Speech Clarity	35	3	50								

Deductive
Reasoning

46

2

56

LEVEL and IMPT (IMPORTANCE) refer to the Target Electric Motor, Power Tool, and Related Repairers. GAP refers to level difference between Maintenance Workers, Machinery and Electric Motor, Power Tool, and Related Repairers.

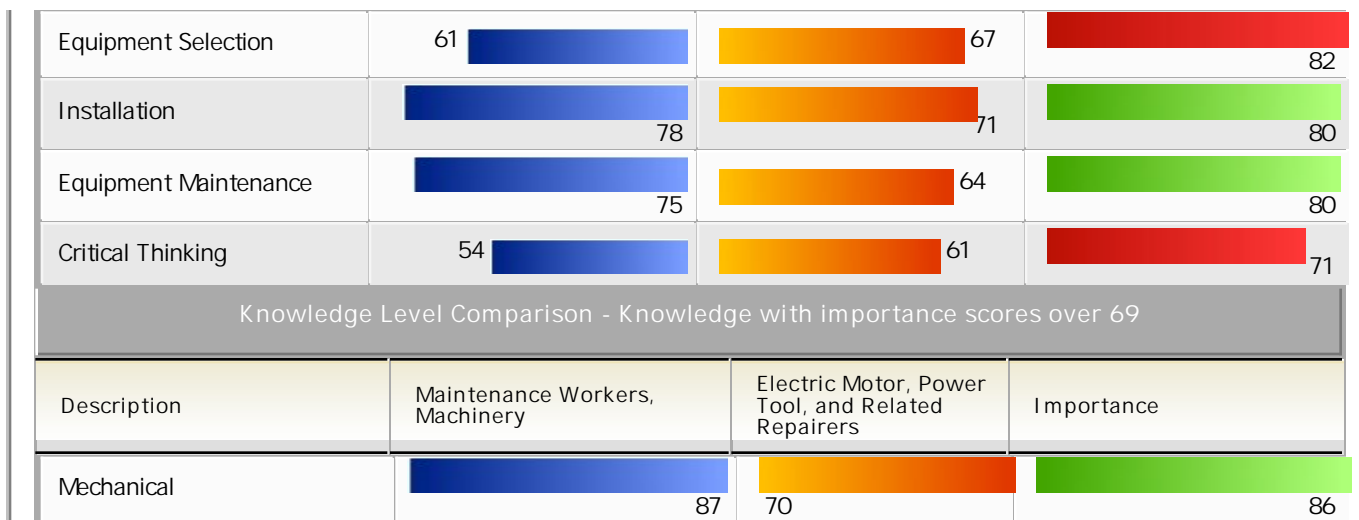
ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

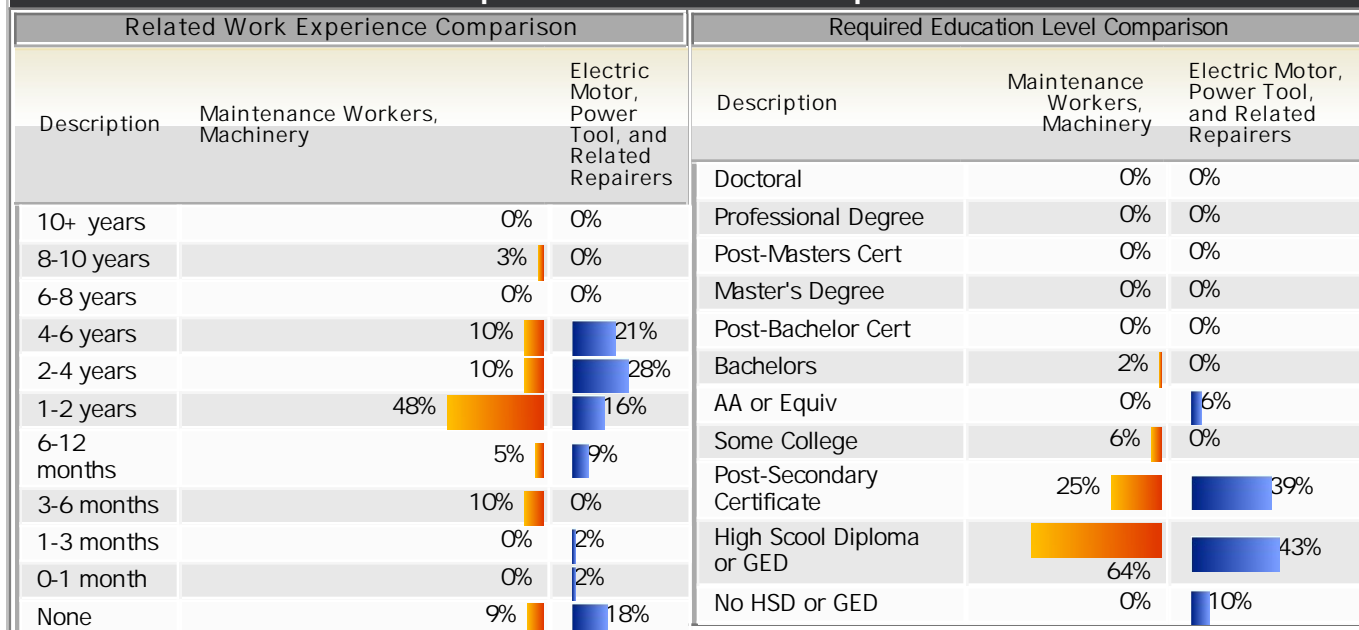
Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Importance
Finger Dexterity	44	59	75
Manual Dexterity	44	55	68
Problem Sensitivity	42	42	65
Information Ordering	42	48	62
Arm-Hand Steadiness	46	50	62
Near Vision	46	51	62
Inductive Reasoning	44	44	59
Visualization	46	50	59
Visual Color Discrimination	37	53	59
Deductive Reasoning	44	46	56
Selective Attention	44	51	56
Reaction Time	42	48	56
Hearing Sensitivity	35	48	56
Speed of Closure	26	41	53
Control Precision	48	55	53
Far Vision	37	42	53
Depth Perception	41	50	53
Oral Comprehension	50	50	50
Written Comprehension	42	48	50
Oral Expression	46	44	50
Category Flexibility	37	44	50
Flexibility of Closure	42	39	50
Multilimb Coordination	41	41	50
Rate Control	37	37	50
Auditory Attention	44	53	50
Speech Recognition	37	37	50
Speech Clarity	32	35	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Importance
Repairing	77	71	84
Troubleshooting	72	71	83



Experience & Education Comparison



Maintenance Workers, Machinery

Electric Motor, Power Tool, and Related Repairers

Most Common Educational/Training Requirement:

Short-term on-the-job training

Postsecondary vocational award

Job Zone Comparison

1 - Job Zone One: Little or No Preparation Needed

3 - Job Zone Three: Medium Preparation Needed

No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.

Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.

Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.

Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Tasks



Maintenance Workers, Machinery

Core Tasks

Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment.
- Collaborate with other workers to repair or move machines, machine parts, or equipment.
- Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas.
- Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists.
- Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs.
- Install, replace, or change machine parts and attachments, according to production specifications.
- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.

Electric Motor, Power Tool, and Related Repairers

Core Tasks

Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Specific Tasks

Occupation Specific Tasks:

- Add water or acid to battery cell solutions to obtain specified concentrations.
- Adjust working parts, such as fan belts, contacts, and springs, using hand tools and gauges.
- Assemble electrical parts such as alternators, generators, starting devices, and switches, following schematic drawings and using hand, machine, and power tools.
- Bolt porcelain insulators to wood parts in order to assemble hot stools.
- Clean cells, cell assemblies, glassware, leads, electrical connections, and battery poles, using scrapers, steam, water, emery cloths, power grinders, or acid.
- Clean, rinse, and dry transformer cases, using boiling water, scrapers, solvents, hoses, and cloths.
- Cut and form insulation, and insert insulation into armature, rotor, or stator slots.
- Disassemble defective equipment so that repairs can be made, using hand tools.
- Drain and filter transformer oil and refill transformers with oil until coils are submerged.
- Hammer out dents and twists in tools and equipment.
- Inspect and test equipment in order to



- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.
- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.
- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to detect problems.
- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures
- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications

locate damage or worn parts and diagnose malfunctions, or read work orders or schematic drawings to determine required repairs.

- Inspect batteries for structural defects such as dented cans, damaged carbon rods and terminals, and defective seals.
- Inspect electrical connections, wiring, relays, charging resistance boxes, and storage batteries, following wiring diagrams.
- Lift units or parts such as motors or generators, using cranes or chain hoists, or signal crane operators to lift heavy parts or subassemblies.
- Lubricate moving parts.
- Maintain stocks of parts.
- Measure velocity, horsepower, revolutions per minute (rpm), amperage, circuitry, and voltage of units or parts to diagnose problems, using ammeters, voltmeters, wattmeters, and other testing devices.
- Position and level battery cells, anodes, or cathodes, using hoists or leveling jacks, or signal other workers to perform positioning and leveling.
- Pour compounds into transformer-case terminal openings in order to seal out moisture.
- Read service guides to find information needed to perform repairs.
- Reassemble repaired electric motors to specified requirements and ratings, using hand tools and electrical meters.
- Record repairs required, parts used, and labor time.
- Reface, ream, and polish commutators and machine parts to specified tolerances, using machine tools.
- Remove and replace defective parts such as coil leads, carbon brushes, and wires, using soldering equipment.
- Repair and operate battery-charging equipment.
- Repair and rebuild defective mechanical parts in electric motors, generators, and related equipment, using hand tools and power tools.
- Rewind coils on cores in slots, or make replacement coils, using coil-winding machines.
- Rewire electrical systems, and repair or replace electrical accessories.
- Scrape and clean units or parts, using cleaning solvents and equipment such as buffing wheels.
- Seal joints with putty, mortar, and asbestos, using putty extruders and knives.
- Set machinery for proper performance, using computers.
- Sharpen tools such as saws, picks, shovels, screwdrivers, and scoops, either



- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting
- operate hoist, winch, or hydraulic boom
- operate sandblasting equipment
- operate vacuum or air hose
- perform safety inspections in industrial, manufacturing or repair setting
- read specifications
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- repair sheet metal products
- requisition stock, materials, supplies or equipment
- signal directions or warnings to coworkers
- test materials or solutions
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use basic carpentry techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels

manually or by using bench grinders and emery wheels.

- Solder, wrap, and coat wires to ensure proper insulation.
- Steam-clean polishing and buffing wheels to remove abrasives and bonding materials, and spray, brush, or recoat surfaces as necessary.
- Test battery charges, and replace or recharge batteries as necessary.
- Test conditions, fluid levels, and specific gravities of electrolyte cells, using voltmeters, hydrometers, and thermometers.
- Test equipment for overheating, using speed gauges and thermometers.
- Verify and adjust alignments and dimensions of parts, using gauges and tracing lathes.
- Weld, braze, or solder electrical connections.

Detailed Tasks

Detailed Work Activities:

- apply cleaning solvents
- assemble gear systems
- clean equipment or machinery
- determine installation, service, or repair needed
- distinguish colors
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- inspect transformer for defects
- install or replace meters, regulators, or related measuring or control devices
- install/connect electrical equipment to power circuit
- lubricate machinery, equipment, or parts
- maintain inventory of supplies
- maintain or repair industrial or related equipment/machinery
- maintain or repair work tools or equipment
- maintain production or work records
- move or fit heavy objects
- operate coil winding machines
- operate hoist, winch, or hydraulic boom
- operate lathes
- perform safety inspections in industrial, manufacturing or repair setting
- read blueprints
- read schematics
- read technical drawings
- read work order, instructions, formulas, or processing charts
- repair electrical transformers



- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches
- Bandsaws
- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs
- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MIG welders
- Micrometers
- Milling machines
- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines

- repair or replace electrical wiring, circuits, fixtures, or equipment
- service batteries or transformers with specified fluids
- sharpen metal objects
- signal directions or warnings to coworkers
- solder electrical or electronic connections or components
- solder metal parts or components together
- test electrical/electronic wiring, equipment, systems or fixtures
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use electrical or electronic test devices or equipment
- use hand or power tools
- use high voltage apparatus
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use soldering equipment
- use voltmeter, ammeter, or ohmmeter

Technology - Examples



- Power drills
- Grinding machines
- Bench saws
- Punches
- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws
- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes

Labor Market Comparison

Labor Market Comparison			
Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Difference



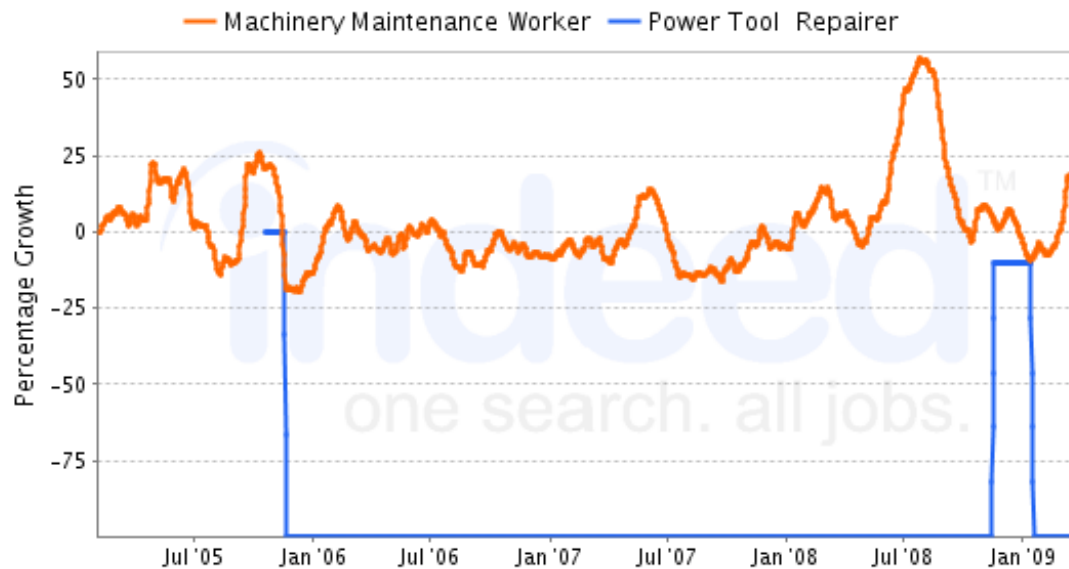
Median Wage	\$ 34,100	\$ 31,210	\$ (2,890)
10th Percentile Wage	\$ 18,630	\$ 21,230	\$ 2,600
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 39,540	\$ 930
90th Percentile Wage	\$ 43,370	\$ 46,250	\$ 2,880
Mean Wage	\$ 32,410	\$ 32,930	\$ 520
Total Employment - 2007	290	170	-120
Employment Base - 2006	337	153	-184
Projected Employment - 2016	278	135	-143
Projected Job Growth - 2006-2016	-17.5 %	-11.8 %	5.7 %
Projected Annual Openings - 2006-2016	5	6	1

National Job Posting Trends

Trend for Maintenance Workers, Machinery

Trend for
Electric
Motor,
Power
Tool, and
Related
Repairers

Job Trends from Indeed.com



Data from [Indeed](http://Indeed.com)

Recommended Programs

Electrician



Electrician. A program that prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric-power wiring; and DC and AC motors, controls, and electrical distribution panels. Includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Washington County Community College	One College Drive	Calais	www.wccc.me.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Southern Maine Community College	2 Fort Road	South Portland	www.smccME.edu

Electrical and Electronics Equipment Installer and

Electrical/Electronics Equipment Installation and Repair, General. A program that generally prepares individuals to apply technical knowledge and skills to operate, maintain, and repair electrical and electronic equipment. Includes instruction in electrical circuitry, simple gearing, linkages and lubrication of machines and appliances, and the use of testing equipment.

No schools available for the program

Major Appliance Installer and Repairer

Appliance Installation and Repair Technology/Technician. A program that prepares individuals to apply technical knowledge and skills to repair, install, and service major gas, electric, and microwave consumer appliances such as stoves, refrigerators, dryers, water heaters, washers, dishwashers, and commercial units such as ice makers and coffee makers.

No schools available for the program

Electrical and Electronics Equipment Installer and

Electrical/Electronics Maintenance and Repair Technology, Other. Any instructional program in electrical and electronics equipment installation and repair not listed above.

No schools available for the program

Miscellaneous Mechanics and Repairers, Other

Precision Systems Maintenance and Repair Technologies, Other. Any instructional program in miscellaneous mechanics and repairers not listed above.

No schools available for the program

Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49
49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8



49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2
47-4021.00	Elevator Installers and Repairers	84	4	0	\$50,960.00	\$16,860.00	0%	0
51-4041.00	Machinists	84	3	1,860	\$41,560.00	\$7,460.00	4%	35

Top Industries for Electric Motor, Power Tool, and Related Repairers

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	27.62%	7,037	6,702	-4.76%
Self-employed workers, primary job	000601	8.55%	2,178	2,088	-4.12%
Electrical and electronic goods merchant wholesalers	423600	7.99%	2,035	2,159	6.11%
Self-employed workers, secondary job	000602	3.96%	1,008	903	-10.40%
Building material and supplies dealers	444100	3.90%	994	1,143	15.01%
Electronic and precision equipment repair and maintenance	811200	2.84%	724	592	-18.20%



Automotive mechanical and electrical repair and maintenance	811110	2.78%	709	758	6.86%
Electrical contractors	238210	2.78%	709	669	-5.63%
Electrical equipment manufacturing	335300	1.74%	444	340	-23.53%
Hardware, and plumbing and heating equipment and supplies merchant wholesalers	423700	1.69%	430	439	2.17%
Converted paper product manufacturing	322200	1.48%	377	285	-24.47%
Personal and household goods repair and maintenance	811400	1.45%	369	308	-16.47%
Professional and commercial equipment and supplies merchant wholesalers	423400	1.29%	329	345	4.91%
Motor vehicle and motor vehicle parts and supplies merchant wholesalers	423100	1.23%	314	323	2.73%
Local government, excluding education and hospitals	939300	1.08%	275	278	1.10%

Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%
Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%